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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,023	10/16/2003	Stanley W. Stone	VRO-020.01	9153

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EXAMINER

FOX, CHARLES A

ART UNIT PAPER NUMBER

3652

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/687,023	<b>Applicant(s)</b> STONE, STANLEY W.	
	<b>Examiner</b> Charles A. Fox	<b>Art Unit</b> 3652	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 March 2006.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 and 51-78 is/are pending in the application.
- 4a) Of the above claim(s) 51-59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 60-78 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Election/Restrictions***

Claims 51-59 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on March 16, 2006. Regarding the traverse of the restriction in the instant application it is noted that the methods set forth in the instant application may be performed by a device that is materially different from the instant invention. As such the restriction is deemed proper and hereby made final.

***Drawings***

The drawings are objected to because Figure 1 shows three arms. It appears the arm labeled process position is arm (18). Whenever a movable element is shown in two positions, it should be drawn with a dashed line in one of the positions. Figure 16c in this application is an example of how a movable element should be illustrated. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the

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remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6,10,12-17,19-22,60-64 and 67-70 are rejected under 35 U.S.C. 102(b) as being anticipated by Sieradzki. Regarding claims 1 and 60 Sieradzki US 5,486,080 discloses a method of transferring wafers comprising the steps of:

retrieving a first wafer from a storage location via a first arm;

transferring the wafer to a second arm;

delivering the wafer for processing via said second arm;

removing the processed wafer via said first arm;

returning the wafer to the storage location using the first arm.

Regarding claim 2 Sieradzki also discloses that a next wafer is retrieved from the storage location while the first wafer is being delivered to the process station.

Regarding claims 3 and 62 Sieradzki further discloses the step of aligning the wafer prior to picking it up with the second arm.

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In regards to claims 4,5 and 6 Sieradzki also discloses that the processing the wafer in a process chamber, said process being ion implantation, wherein said wafer is reoriented as part of the overall process.

Regarding claim 10 Sieradzki further teaches that while the first wafer is being returned to the storage location the second arm is delivering a next wafer to the process location.

Regarding claims 12 and 13 Sieradzki discloses aligning the first and second arms are during transfer of the wafer and a controller for operation of the orientation device during said transfer.

Regarding claim 14 Sieradzki discloses a method of transferring wafer comprising:

- retrieving a first wafer from a storage location via a first arm;

- transferring the wafer to a second arm;

- delivering the wafer for processing via said second arm, while retrieving a next wafer with the first arm;

- processing the first wafer, while at the same time transferring the next wafer to said second arm;

- removing the processed wafer via said first arm;

- returning the wafer to the storage location using the first arm, while delivering the next wafer for processing via said second arm

Regarding claims 15 and 16 also discloses the step of iteratively processing all the wafers within a cassette, wherein said process step includes ion implantation.

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Regarding claim 17 Sieradzki further discloses controlling an orienter to transfer the wafers from the first to the second arm.

Regarding claim 19 Sieradzki discloses a method of handling wafers comprising the steps of:

processing wafers from a first cassette in a first loadlock, using two arms;

cycling a second load lock while said wafers in the first cassette are being processed;

completing the processing of said first wafers and cycling said first load lock;

processing wafers from the second load lock via two arms.

Regarding claim 20 Sieradzki also discloses cycling of the first load lock after all wafers within the first cassette are processed.

Regarding claim 21 Sieradzki further teaches using the two load locks to iteratively process a plurality of wafer cassettes through said system.

Regarding claim 22 the cycling of said load locks includes at least venting and evacuating said load locks.

Regarding claim 61 Sieradzki further teaches the returning and retrieving steps are performed in an iterative manner until all the wafers in a cassette are processed.

Regarding claim 63 Sieradzki further discloses orienting the wafer prior to returning the wafer to the cassette.

Regarding claim 64 Sieradzki teaches that a cassette is selected by a controller before the wafers are retrieved from said cassette.

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Regarding claim 67 Sieradzki discloses a method of transferring wafers comprising the steps of:

- retrieving a next wafer via a first arm;

- removing a processed wafer from a process position via a second arm;

- delivering the next wafer for processing;

- returning the processed wafer to a storage location;

- iteratively retrieving, processing and returning wafers from a storage location while alternatively using said first and second arms.

Regarding claims 68 and 69 Sieradzki further discloses that the returning step occurs at the same time as the ion implantation process is preformed on a next wafer.

Regarding claim 70 Sieradzki further discloses orienting the next wafer prior to delivery to said process location.

Claims 74,75 and 77 rejected under 35 U.S.C. 102(b) as being anticipated by Tabrizi et al. Regarding claims 74and 77 Tabrizi et al. Us 6,315,512 discloses a method of transferring wafers comprising the steps:

- retrieving a first wafer from a storage location with a first arm, while a second arm removes a processed wafer from a process device;

- delivering the first wafer for processing;

- returning the processed wafer to a storage location as the first wafer is being processed;

- retrieving a next wafer with said second arm while the first arm removes the first wafer from the process device;

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delivering the next wafer for processing;

iterating the above steps by alternately using said first and second arms until all wafers in a cassette have been processed.

Regarding claim 75 Tabrizi et al. also disclose orienting the wafers prior to delivering them to the process chamber.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-9,18,71 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sieradzki as applied to claims 1,2,14, and 67 above, and further in view of Bowling et al. Sieradzki teaches the limitations of claims 1,2,14 and 67 as above, he does not teach indexing the wafer cassette during loading and unloading. Bowling et al. US 4,718,975 teaches a method of transferring wafers comprising the steps:

retrieving a wafer from a cassette;

processing said wafer;

returning said wafer to said cassette;

wherein said cassette is indexed up and down during said retrieval and returning steps. It would have been obvious to one of ordinary skill in the art, at the time of



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invention to provide modify the methods taught by Sieradzki by indexing the cassette as taught by Bowling et al. in order to access all the wafers within any particular cassette.

Claims 65 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sieradzki as applied to claims 60 and 67 above, and further in view of Yamaga et al. Sieradzki teaches the limitations of claims 60 and 67, he does not teach providing a sensor to monitor the wafers within the cassette. Yamaga et al. US2001/0014267 teaches a method of transferring wafers comprising the steps of:

placing a wafer cassette in a location where wafers may be removed and placed into the cassette;

using a sensor to determine the amount and location of wafers within the cassette;

wherein said first sensing step involves determining if any unprocessed wafers are within said cassette. It would have been obvious to one of ordinary skill in the art, at the time of invention to modify the methods taught by Sieradzki by determining the amount of wafers in the cassette as taught by Yamaga et al. in order to control the device such that it only tries to retrieve wafers that are known to be within the cassette.

Claim 78 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tabrizi et al. While Tabrizi et al. does not teach any particular type of processing being done in chamber (410) It would have been obvious to one of ordinary skill in the art, at the time of invention that the process could be one of photoresist, dry etch, ion implantation, chemical deposition or diffusion, as these are common processes that occur in the art of wafer manufacturing.

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Claim 76 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tabrizi et al. as applied to claim 74 above, and further in view of Bowling et al. Tabrizi et al. teaches the limitations of claim 74 as above, they do not teach indexing the wafer cassette during loading and unloading. Bowling et al. teaches a method of transferring wafers comprising the steps:

- retrieving a wafer from a cassette;

- processing said wafer;

- returning said wafer to said cassette;

wherein said cassette is indexed up and down during said retrieval and returning steps. It would have been obvious to one of ordinary skill in the art, at the time of invention to modify the methods taught by Tabrizi et al. by indexing the cassette as taught by Bowling et al. in order to access all the wafers within any particular cassette.

Claims 11 and 73 rejected under 35 U.S.C. 103(a) as being unpatentable over Sieradzki as applied to claims 1 and 67 above, and further in view of Tabrizi et al. Sieradzki teaches the limitations of claims 1 and 67 as above, they do not explicitly teach placing one of the arms in a standby position as the other arm operates. Tabrizi et al. teaches placing a second set of arms in a preselected standby position while another set of arms accesses a storage location for wafers. It would have been obvious to one of ordinary skill in the art, at the time of invention to modify the methods taught by Sieradzki by using a standby position as taught by Tabrizi et al. in order to have the second arm set in position once the first arm set is clear of the storage area while keeping the arms from interfering with each other.


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The prior art made of record and not relied upon, but considered pertinent to applicant's disclosure is Araki 1996, Raaijmakers 2002, Hofmeister 2002 and Talmer 2005.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles A. Fox whose telephone number is 571-272-6923. The examiner can normally be reached between 7:00-4:00 Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eileen D. Lillis can be reached at 571-272-6928. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 5-16-04  
Charles A. Fox  
Examiner  
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